CHAPTEE XXII

i

THE PRINCIPAL METPIODS OF WORKING THE BASIC OPEN-HEARTH PROCESS

(a) The Pig and Scrcvp Process.

THE oldest and most widely distributed mode of open-hearth steel-melting is the pig and scrap process. This allows of working with a high per cent, charge of old iron (called scrap), and furnishes thus the means of regenerating huge amounts of iron which are daily withdrawn in all orders of human activity as having become unusable. Nevertheless, one cannot exclusively employ wrought iron or steel scrap, since the amount of reducing agents contained therein do not suffice to take up the oxidising action of the gases of the flame. It soon became apparent that pig iron was the most suitable material through which reducing agents lacking in the scrap could be added. Pig iron is a concentrated solution of several reducing agents in iron, and various advantages arise due to this. Firstly, pig iron melts much more easily than scrap. Therefore, it forms itself soon into a pool of molten metal in the furnace in which the remainder of the charge dips, whereby this also more rapidly attains fusion. The reducing agents already in the dissolved state in the pig iron thereby distribute themselves over the whole mass of metal when it becomes fused, and this thus obtains an equalised and desirable composition for the process. The value of the individual reducing agents for open-hearth furnace working is different; therefore the course of the same depends to some extent on the selection of the reducing agents, and consequently the quality of pig iron to be employed.

Silicon causes an increased heat demand, and therefore appears undesirable. On the other hand, silicon is easily oxidised, and facilitates considerably the formation of slag,